

Appl. No. : 10/629,029  
Filed : July 29, 2003

**IN THE SPECIFICATION:**

Please replace paragraph [0070] with the following amended paragraph:

[0070] Referring now to Figure 2A, an embodiment of a sublimation apparatus 29 of a semiconductor processing system is shown employing a coated support medium as a guidance structure. In the illustrated embodiment, the support medium is formed from “flowable” support elements comprising beads 6 which are packed into the sublimation vessel 1. Preferably, these beads are configured to provide tortuous pathways for a carrier gas. The inlet port 2 is configured as an entrance for carrier gas while the outlet port 3 is configured as an exit for carrier gas having passed through the beads 6. The sublimation vessel 1 also preferably has a fill port 8 in order to facilitate the replacement of the support elements. Preferably, the inlet port 2 and the outlet port 3 define a primary axis of the sublimation vessel 1. In the illustrated embodiment, the sublimation vessel 1 is a cylinder with the inlet port 2 located at one end of the cylinder and outlet port 3 located at the opposite end, although the skilled artisan will appreciate that the vessel can take any suitable shape. In addition, the vessel 1 also preferably has a heater 26 in order to affect and control the vaporization of the solid source coating 7 (Figure 2C[[2B]]) on the beads 6, such as the illustrated resistive heating elements surrounding the vessel 1. The vessel 1 also preferably includes distribution manifolds (not shown) at the inlet 2 and outlet 3 of the sublimation vessel, the manifold being configured distribute to carrier gas more evenly across the vessel for uniform contact with the coated support medium. While illustrated herein as heating elements within walls of the vessel, heating can take any of a number of forms. In one embodiment, the vessel is radiantly heated within a vacuum chamber. Greater detail of this radiant heating system can be found in U.S. Application 09/854,706, filed May 14, 2001, the disclosure of which is incorporated by reference in its entirety.

Please replace paragraph [0097] with the following amended paragraph:

[0097] Referring initially to Figures 10-12, the vessel 200 comprises an external container 205 and a lid component 210. A similar system, employing an inner container to facilitate loading[[an]]\_or unloading of solid source material, is disclosed in co-owned Finnish application FI 20001166, filed on May 15, 2000 and corresponding U.S. publication No. 2001/0042523, published November 22, 2001 (hereinafter “Kesala”), the disclosure of which is

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incorporated herein by reference. In the illustrated embodiment, the external container 205 includes a flange 207 configured to permit bolting of the lid 210 with the external container 205, although the skilled artisan will appreciate a variety of other methods of removably closing the lid 210 upon the container 205. The lid 210 of the illustrated embodiment is removable and includes an inlet conduit 215 and an outlet conduit 220, as well as a plurality of manual isolation valves 222, 224, 226 for use when opening the vessel 200 for maintenance or recharging. The lid is removed for charging the vessel, while the plurality of valves are used to direct flow through, from or around the vessel.

Please replace paragraph [0106] with the following amended paragraph:

[0106] In a preferred embodiment shown in Figures 20A-20C, one or more of divided trays 328, 329, or 330 is employed in the vessel system shown in Figure 18. Figure 20A shows a divided lower tray 328, while Figure 20B shows an upper tray 329. With reference to both Figure 20A and 20B, the divided tray 330 includes a secondary partial divider 334 partially dividing (in the horizontal direction) the main compartment into a first path 340 and a second path 342, as compared with tray 230 (Figure 15) which has a single path in the form of main compartment 235. The secondary partial divider 334 is configured to guide the carrier gas flow 331 to travel in one direction around the tray preferably at least about a 200° arc (more preferably at least 300°) on a first tray path 340 and, then, turn 180° around and travel preferably at least about a 200° arc (more preferably at least 300°) in the opposite direction on a second tray path 342 before exiting the tray 330. The first tray path 340 is connected to the second tray path 342 by a gap 344 in the secondary partial divider 334 which serves to join the end of the first tray path 340 with the beginning of the second tray path 342. This gap 344 is where the carrier gas flow 331 is guided to performs a “U-turn” of about 180° and change directions to begin traveling the second tray path 342. In certain preferred embodiments, the corners to which the flow is exposed at proximate to the gap 344 are rounded to minimize flow stagnation from sharply angled corners. An inlet conduit feeds into at inlet 350 at the beginning of the first tray path 340, preferably having a filter plate[[355]]\_335 which extends to substantially prevent powder from entering both the inlet 350 and the outlet 354 located at the end of the second tray path 342. The outlet 354 serves as an exit for the carrier gas flow 331 from the second tray path 342 to an overlying tray (not shown) via the outlet conduit (not shown).

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Please replace paragraph [0114] with the following amended paragraph:

[0114] It should be noted that the method shown in Figure[[20]] 21 illustrates the cycle for each single reactant. The method steps shown can be easily adapted in view of Figure 9 (employing a first and second reactant) to include alternating two or more different reactants.

Please replace Table 3 in paragraph [0144] with the following amended table:

**Table 3**  
**Conversion vs. Residence Time Distribution for First Order Kinetics**

Type of Reactor	Conversion	Residence Time Distribution (RTD)
Plug-flow reactor	0.63	<del>Fig. 21, vertical line</del> $D_L/uL = 0$
Actual tubular reactor	0.61	
Stirred-tank reactor	0.50	<del>Fig. 21, dashed curve</del> $D_L/uL = \infty$
Dispersion model	0.60	$D_L/\mu L = 0.117$
Series STR model	0.60	$n = 5$